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Surgical Therapy of Extracranial Carotid Artery Aneurysms: Long-Term Results over a 24-Year Period

Attigah N., Külkens S., Zausig N., Hansmann J., Ringleb P., Hakimi M., Eckstein H.-H., Allenberg J.-R., Böckler D. Eur J Vasc Endovasc Surg 2009;37:127-33.

Background: To evaluate long-term results of surgical therapy of extracranial carotid artery aneurysms (ECCA) and to provide a morphologic classification for individual surgical reconstruction techniques.

Patient and methods: This retrospective analysis includes 57 patients (43 male, mean age 61.9 years.) with 64 carotid reconstructions for ECCA between 1980 and 2004. In 29 (50.9%) of the patients there was found a cerebral ischemic event as an initial symptom (18 transient ischemic attacks, 11 strokes). In patients without cerebral events, the presenting symptom was pulsatile cervical mass in 19 and cranial nerve dysfunction in 3 cases. ECCA was morphologically stratified in Type I = isolated aneurysms of the internal carotid artery ($n = 25$), Type II = aneurysms of the complete internal carotid artery with involvement of the bifurcation ($n = 8$), Type III = aneurysms of the carotid bifurcation ($n = 20$), Type IV = combined aneurysm of the internal and common carotid artery ($n = 5$) and Type V = isolated aneurysm of the common carotid artery ($n = 6$).

Results: Perioperative stroke rate was 1.6%. 4 patients suffered from transient ischemic attacks (6.3%). Permanent and transient cranial nerve injury rate was 6.3% and 20.3% respectively. After 5, 10, 15 and 20 years the actuarial survival was 90%, 77%, 65% and 57%. The ipsilateral stroke-free time was 96%, 96%, 93% and 87%, respectively.

Conclusions: Surgical reconstruction of extracranial carotid aneurysms is a safe procedure with good long-term results. The risk of a permanent, perioperative cerebral neurological deficit is low, but there is a considerable risk of cranial nerve injury.

Dacron Patch Infection Following Carotid Endarterectomy: A Systematic Review of the Literature

Knight B.C., Tait W.F. Eur J Vasc Endovasc Surg 2009;37:140-8.

Our report encompasses two cases of Dacron patch infection following carotid endarterectomy and a systematic review of the literature. Particular attention is placed on the incidence, aetiology, investigation, presentation and management dilemmas of this rare complication of carotid surgery. We present all known cases of synthetic patch infection following carotid endarterectomy over the last 12 years. 14 publications have been identified totalling 77 cases of graft infection. Approximately 0.25–0.5% of all Dacron patches appear to get infected. Infection may present early or late and appears to have a bi-modal distribution depending on the presence of low- or high-grade infection. Post-operative complications especially wound haematoma is associated with the later development of infection. Most patients present with pseudoaneurysm formation, neck swelling or a draining local sinus and are infected with either *Staphylococcus epidermidis* or *Staphylococcus aureus*. Duplex ultrasound is the investigation of choice and complete excision of all infected material and arterial reconstruction with a vein patch or graft is recommended.

Dacron patch infection is a rare but recognised complication of carotid surgery and knowledge of this condition is vital for vascular surgeons and other speciality surgeons to whom cases may present.

Endovascular Repair of the Thoracic Aorta: Predictors of 30-Day Mortality in Patients on the New Zealand Thoracic Aortic Stent Database (NZ TAS)

Day C.P., Buckenham T.M. Eur J Vasc Endovasc Surg 2009;37:160-5.

Objectives: To evaluate data in the New Zealand Thoracic Aortic Stent database to try and identify a scoring system that could predict 30-day mortality in patients undergoing stenting of the descending thoracic aorta (TEVAR).

Design: Retrospective analysis of the New Zealand thoracic aortic stent database between December 2001 and August 2007.

Materials and methods: The 30-day mortality of the 122 patients is 7.38% ($n = 9$). Risk factors were recorded based on the Society of Thoracic Surgeons (STS) risk score. Glasgow aneurysm score was calculated and the pathology being treated analysed. Univariate analyisis was carried out.

Results: The mortality of three pathology groups was compared. 30-day mortality was 2.04% ($n = 1$) in the elective aneurysm group, 17.95% ($n = 7$) in the complicated Stanford type B dissection group, and 0% ($n = 0$) in the trauma group. Thirty-day mortality is significantly higher in the dissection group compared with the elective aneurysm ($p = 0.02$) and trauma ($p = 0.03$) groups. The most frequent risk factors in the dissection group of patients were peripheral vascular disease, smoking and hypertension. Although percentage mortality is higher with increasing GAS, the results are not statistically significant ($p = 0.34$). No independent risk factors were identified from the STS risk score data.

Conclusion: No specific risk score system seems to be able to predict mortality in TEVAR patients.

Aortic Pulsatile Distention in Young Healthy Volunteers is Asymmetric: Analysis with ECG-gated MRI

van Prehn J., Vincken K.L., Sprinkhuizen S.M., Viergever M.A., van Keulen J.W., van Herwaarden J.A., Moll F.L., Bartels L.W. Eur J Vasc Endovasc Surg 2009;37:168-74.

Objective: Knowledge of aortic shape changes throughout the cardiac cycle can offer improved understanding of vascular pathophysiology and may have crucial impact on stentgraft design and EVAR durability. To understand underlying mechanisms of dynamic changes in aortic aneurysm (neck) morphology, the undiseased aorta has to be studied first. Objective is to visualize and characterize dynamic aortic shape changes in young healthy volunteers.

Materials and methods: Fifteen healthy volunteers (7 male, median age 24 year, range 18–28) were scanned using ECG-gated balanced gradient-echo MRI, with 16 reconstructed cardiac phases. Transverse scans were made perpendicular to the aorta: (A) above the aortic bifurcation, (B) infrarenal, (C) juxtarenal, (D) suprarenal and (E) above the celiac trunk. After aortic lumen segmentation, radial changes during the cardiac cycle were measured, from the center of mass, over 360 degrees, and plotted. An ellipse was fitted over the distention plots, yielding the direction (AP:0°, Right: −90°, Left: 90°) and magnitude of radius change over the major and minor axis.

Results: Asymmetric distention was observed, with a variable rate per patient and level. Radius changes decreased from the proximal to distal aorta. Radius changes over the major axis ranged from 14% to 41%. At level A mean change in radius over the minor versus major axis was 1.4 ± 0.2 mm (17%) versus 1.6 ± 0.2 mm (20%), respectively. At B 1.7 ± 0.4 mm (22%) versus 2.0 ± 0.4 mm (25%), at C 1.7 ± 0.4 mm (22%) versus 2.2 ± 0.4 mm (27%) at D 2.0 ± 0.4 mm (25%) versus 2.4 ± 0.5 mm (30%) and at E 2.2 ± 0.3 mm (27%) versus 2.6 ± 0.3 mm (32%). Mean orientation of the major axis was (A) 0.8 ± 23.3°, (B) 1.8 ± 31.3°, (C) 14.0 ± 15.5°, (D) −28.8 ± 48.0° and (E) 18.4 ± 22.2°.

Conclusions: Aortic pulsatile distention in young healthy volunteers is asymmetric, with up to 41% radius change in the descending aorta. This study offers a frame of reference for dynamic imaging studies in patients with aortic pathology and provides a valuable non-invasive tool for future research into aortic distention, development and localization of vascular pathology.

Treatment of Complex Aneurysmal Disease with Fenestrated and Branched Stent Grafts

Bicknell C.D., Cheshire N.J.W., Riga C.V., Bourke P., Wolfe J.H.N., Gibbs R.G.J., Jenkins M.P., Hamady M. Eur J Vasc Endovasc Surg 2009;37:175-81.

Objectives: To describe our experience of treating juxtarenal (JRAAA's <4 mm neck) and thoracoabdominal aortic aneurysms (TAAA's) using fenestrated and branched stent graft technology.

Design: Prospective single centre experience.

Methods: Since 2005, 29 fenestrated/branched procedures have been performed. 15 patients are studied with JRAAAs ($n = 7$; median neck length 0 mm (IQR 0–3.8)) or TAAAs (type I ($n = 2$), III ($n = 2$), IV ($n = 4$)). ASA grade III in 12/15. Maximum diameter of aneurysm 64 mm (56–74 mm). Aneurysms were excluded using covered stents or branches from the main body to patent visceral vessels (40 target vessels total). Pre-operative and follow-up CT scans (1, 3, and 12 months) were analysed by a single Vascular Interventional Radiologist.

Results: Technical success for cannulation and stenting of target vessels was 98%. In-hospital mortality was 0%. One patient underwent conversion to open repair. Five had major complications including one